

REMARKS

Claims 1, 2, 6, 7, 11 and 12 are all the claims pending in the application.

Claims 1 and 6 are amended herein to recite “ . . . mixing the monomer solution and carbon dioxide in the joint mixer to produce a uniform mixture; feeding the resulting uniform mixture to a continuous reactor . . .” to clarify and further distinguish the claimed invention over the prior art. Support for the amendment can be found, for example, in the Examples. See, e.g., Example 1 on page 10, lines 12-13. Hence no new matter is introduced.

I. Response to Examiner’s Answer

A. Claim Rejections under 35 U.S.C. § 112, 1st Paragraph and New Matter

Objection to the Specification

On page 4, of the Examiner’s Answer, the Examiner addresses the new matter rejection of the claims and the new matter objection to the specification. It is the Examiner’s position that the specification does not provide guidance for the term “molecular weight” or how the molecular weight is determined. Examiner’s Answer, page 4, lines 5-7. Further, with respect to the objection to the specification, the Examiner maintains her position that the amendment to change the term “weight average molecular weight” to “molecular weight” is new matter that is not supported by the original specification.

In the response to the arguments presented in the Appeal Brief that the term “molecular weight” has literal support in the specification, the Examiner states that the term “molecular weight *of 100,000*” (emphasis added) has no literal support in the original specification. In this regard, the Examiner makes the following assertions:

(1) The numerical values of 100,000 do not appear on the pages referred to as providing literal support for the term "molecular weight".

(2) Appellants contradict themselves on page 10, first paragraph of the Brief in stating that the weight average molecular weight of 1,020,000 is identified.

(3) There is no such term as "actual molecular weight" as referred to in the Brief in the statement that one of ordinary skill in the art would recognize that the components are discussed in terms of their "actual molecular weight."

(4) The instant specification provides expressly for "the specific components thereof as having a weight average molecular weight of 100,000 or less" (page 11, lines 1-2).

(5) The Examples in the specification provide for Mw of 100,000 or less (Examples 1-3 on pages 10-11), which refers to weight average molecular weight and not to "actual" molecular weight.

(6) As originally filed the specification provides "the acrylic pressure-sensitive adhesive comprises preferably 10% by weight or less, more preferably 6.5% by weight based on the weight of the total monomers, of components having a weight average molecular weight of 100,000 or less" has literal support while removing the term "weight average" introduces new matter in the specification.

(7) The certified translation of the Japanese priority document has never been submitted and is not incorporated by reference in the present application.

Applicants respectfully traverse the Examiner's position and submit the following in response to the Examiner's assertions.

As for paragraph (1), Applicants submit that the specification should be read as a whole and considered in view of what one of ordinary skill in the art would glean from the teachings in the specification as a whole.

Regarding the new matter objection, the disclosure at page 8, lines 18-20, of the original specification describes "the molecular weight distribution. . . having very less low molecular weight components can be obtained". As is apparent from this description, the acrylic pressure-sensitive adhesive according to the present invention has a narrow molecular weight distribution and contains a small amount of low molecular weight components. The expression "low molecular weight component" does not refer to "weight average molecular weight", but to components in a certain range contained in the entire polymer. To define such components, "molecular weight" is used.

Further, the teachings in the present specification are consistent on the whole with the entire object of the invention, which is to produce an acrylic polymer "with a reduced **low molecular [weight] component content** as compared to polymers produced in the presence of an organic solvent" (emphasis added). See specification, page 6, line 16.

On pages 2-3, of the present specification, as originally filed, the problems the inventors seek to overcome are discussed, namely, increased polymerization conversion leading to a wider molecular weight distribution with a considerable proportion of "low-molecular [weight] components" and the existence of a large amount of "low-molecular [weight] components leading to unacceptable pressure-sensitive adhesive properties and increased components that may be transferred to an adherend to cause contamination. Page 2, lines 19-25 of the specification. On page 3 of the original specification, it is disclosed that in a continuous

process, production of "low molecular [weight] components can be suppressed and a polymer having a narrow molecular weight distribution can be produced in its ideal mode. Page 3, lines 5-14 of the present specification. Further, as described in the specification on page 8, lines 19-20, the process of the present invention produces an acrylic pressure sensitive adhesive having "**very less low molecular [weight] components**" (emphasis added). On page 9 of the specification, it states, "the resulting polymer has a narrow molecular weight distribution (Mw/Mn) with a **reduced low molecular [weight] component content**" (emphasis added).

The Examiner seems to rely primarily on the fact that no numerical values are disclosed in relation to the above mentioned passages in support of her position that there is no literal support for the term "molecular weight" as used in Examples of the amended specification. However, Applicants submit that the fact that the numerical value of 100,000 is not recited in the specific passages of the specification referring to low molecular weights components is not considered as a determinative factor for whether one of ordinary skill in the art would determine if the term "weight average molecular weight" or "molecular weight" was intended. Applicants submit that the teachings, content and the context of the original specification as a whole is the proper source for determining the meaning and scope of the disclosure and the claims.

In regard to paragraph (2) above, Applicants submit that the Examiner appears to misunderstand Applicants' statements made in the Appeal Brief. Further it appears that the Examiner misunderstands the invention. In this regard Applicants first note that there is no mention of "the weight average molecular weight of 1,020,000" on page 10, 1st paragraph of Appellants' Brief. It is stated in the specification on page 10, at lines 26-27 "the continuously

obtained bulk polymer had . . . a weight average molecular weight (Mw) of 1,020,000". Therefore, Applicants assume that this is the statement that the Examiner is referring to in the Examiner's Answer on page 9, at lines 9-11. However, this statement is not contradictory to Applicants arguments. The point is that the term "weight average molecular weight (Mw)" as used on page 10, line 26 of the specification and in the other examples of the specification referenced by the Examiner (Example 2, page 11, line 12; Example 3, page 11, line 25; Example 4, page 12, line 26; Example 5, page 13, line 24; and Example 6, page 14, line 11), refers to the weight average molecular weight of the polymer, which in Example 1 is 1,020,000. However, the subsequent term, "Mw of 100,000" as used in the statement "the proportion of components having an Mw of 100,000 or less was 2.99%" has a different meaning and was intended to refer to "molecular weight" of the low molecular weight components of the polymer.

Applicants also provide a similar consistent explanation in the Appeal Brief on page 5, in the second full paragraph, which is incorporated herein by reference, in regard to the terms "weight average molecular weight" and "molecular weight" having different meanings. It states, "[f]or example, Example 1 refers to the bulk polymer having a molecular weight of 1,020,000 (see page 10, lines 26-27), so it does not make any sense for the example to subsequently refer to the specific components thereof as having a weight average molecular weight of 100,000 or less (see page 11, lines 1-2)."

Thus, in view of the above and in view of the arguments and evidence of record and the specification itself, it is clear to one of ordinary skill in the art that the term "weight average molecular weight" as used in the Examples of the specification refers to the weight average

molecular weight of the obtained bulk polymer and the term “Mw of 100,000 or less” refers to the molecular weight of the individual components of the obtained bulk polymer that have a molecular weight of 100,000 or less.

In regard to paragraph (3) above, with respect to the use of the term “actual molecular weight”, Applicants note that the term “actual” was used as a descriptive term to refer to the weight or mass of the low molecular weight components, i.e., monomers or molecules of the bulk polymer. Applicants agree that the term, “actual molecular weight” may not be a technically accurate term. However, the term as used in the arguments of the Appeal Brief is used to emphasize the difference between “molecular weight” of components of the bulk polymer of the claimed invention and “weight average molecular weight” of the entire individual polymer.

In regard to paragraphs (4) – (6) above, Applicants reiterate the arguments of record, which are incorporated herein.

In regard to paragraph (7) above, Applicants note that during a telephone conversation, the Examiner previously indicated that submission of a sworn English translation of the Japanese language priority document would not be sufficient to overcome the rejection because a foreign language priority document that is not incorporated by reference may not be relied upon to correct an error in the specification. Therefore, Applicants did not submit a sworn English translation of the priority document. However, Applicants are not opposed to submitting a copy of a sworn English translation of the Japanese priority application as additional evidence to corroborate the statements made on the record in regard to the translation error, if the Examiner will consider it as such.

In view of the above, Applicants submit that changing "weight average molecular weight" to "weight average molecular weight" is not new matter. Accordingly, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 112, 1st paragraph and the new matter objection to the specification.

B. Claim Rejection under 35 U.S.C. § 112, 2nd Paragraph

In support of the position that the term "molecular weight" is indefinite, the Examiner relies on *Ex parte* Simpson for the principle "that molecular weight of a particular polymer yield significantly different 'number average', and 'weight average' numerical values". The Examiner characterizes *Ex parte* Simpson as dealing with issues of indefiniteness of a molecular weight recitation and an opinion based Declaration and cites language in the head note of the case apparently in an effort to substantiate her interpretation of the legal holding and effect of the case.

However, as pointed out in Appellants Brief on page 18, *Ex parte* Simpson is an unpublished decision of the Board of Patent Appeals and Interferences and is not a precedential decision. This means that *Ex parte* Simpson is not controlling law.

In addition, the head notes of the case are not part of the court's decision and should not be relied upon as a statement of the findings of the court, a statement of the law applied by the court, or a statement of the holding of the case. The head notes are merely "sound bites" taken from the case and used as a legal research tool. Therefore, the actual text of the case must be read and analyzed in its proper context. In this regard, taken in its proper context, the central issue of *Ex parte* Simpson is the probative value of a Declaration filed during prosecution

of an application, which is not an issue in the present case. Thus, in addition to being non-precedential, *Ex parte* Simpson is not relevant to the issues in the present case.

In response to the arguments presented in the Appeal Brief that the term "molecular weight" is definite, the Examiner states that Applicants' arguments hinge on a number of citations taken out of context that recite the term "molecular weight" without referring to the weight average or number average molecular weight. See page 12, lines 1-4 of the Examiner's Answer. In this regard, the Examiner makes the following assertions:

- (1) The definition taken from Grant & Hackh's Chemical Dictionary is a poor example to support the molecular weight of "**polymers**" (emphasis added by Examiner) because the definition refers only to "low molecular [weight] compounds, which is proven by the value of 375" and other examples in the Brief such as methanol (MW 32) and ethanol (MW 46).
- (2) Appellants' statement that GPC can be used to measure molecular weight "with respect to the entire polymer", is incorrect.
- (3) The patents cited by Appellants in support of the argument that the term "molecular weight" is art recognized as used in the present specification (as amended), recite numerical values that are either weight average or number average molecular weights.
- (4) The Examiner provides a reference, George Odian, "Principles of Polymerization" in support of the position that "molecular weight" of polymers is appropriately characterized as "weight average molecular weight", "number average molecular weight" or "viscosity average molecular weight".
- (5) The Examiner states that the arguments regarding *Ex parte* Simpson supporting Applicants' position are not persuasive since when a molecular weight is characterized by a

numerical value, the numerical value should be characterized as a weight average, number or viscosity average molecular weight.

Applicants respectfully traverse the rejection for the following reasons.

In regard to paragraph (1) above, the Examiner refers to page 13 of the Brief, however Applicants believe that the portion of the Brief the Examiner intended to refer to is on page 5 of the Brief. Further, Applicants note that the Examiner's reference to "375" as a molecular weight value in Grant & Hackh's Dictionary is misplaced as "375" is the page of the dictionary on which the definition is cited.

In stating that the definition from Grant & Hackh's Chemical Dictionary is a poor example to support the molecular weight of polymers, the Examiner appears to misunderstand the invention and the arguments in the Appeal Brief distinguishing between the obtained bulk polymer of the invention and the individual low molecular weight components of the bulk polymer. For instance the dictionary definition referred to in Grant & Hackh's is submitted to establish that the term "molecular weight" is a term of art and is correctly used in the amended specification to refer to the individual low molecular weight components of the polymer and not the bulk polymer itself. The bulk polymer is correctly described in terms of the "weight average molecular weight" in the original specification and in the specification as amended.

The Examiner herself, in stating that the cited dictionary definition refers "only and solely to low molecular [weight] compounds", appears to correctly recognize that the term "molecular weight" is appropriately used to refer to low molecular [weight] components which is consistent with Applicants' position and with the disclosure in the original specification and as amended. Further, the Examiner's statement that the molecular weight of low molecular

[weight] compounds is absolutely different from the molecular weight of polymers is also consistent with Applicants' position that the terms "molecular weight" and "weight average molecular weight" are different and are used to refer to individual low molecular weight components of the bulk polymer and the bulk polymer, respectively.

In regard to paragraph (2) above, Applicants note that the Examiner does not provide a citation for the quoted phrase "with respect to the entire polymer" and it appears that the Examiner takes this statement out of context. On page 9 of the Appeal Brief, lines 9-11, it is stated, "the meaning intended throughout the specification and claims in the present application is the *amount of polymer molecules having a molecular weight of 10⁵ or lower that are present with respect to the entire polymer* (see, GPC chart below.). This does not state or indicate that GPC is used to measure the molecular weight with respect to the entire polymer. In fact, on page 9, lines 16-17, of the Brief, it states that GPC is used to measure the molecular weight distribution of the polymer, which is consistent with the statement made by the Examiner that GPC is used to measure the molecular weight distribution. See page 12, lines 14-16 of the Examiner's Answer.

In regard to paragraph (3) above, the Examiner refers to U.S. Patent No. 6,444,772 as not being relevant to the current situation, because it relates to low molecular [weight] compounds having a molecular weight in the range of 116-297. Applicants admit that the co solvents in the table in columns 2 and 3 of the '772 patent refers to small molecule compounds; however, as indicated on page 11, lines 7-9 of the Appeal Brief, the "molecular weight" of various polymers is provided in Tables II and III. Thus Applicants submit that one of ordinary

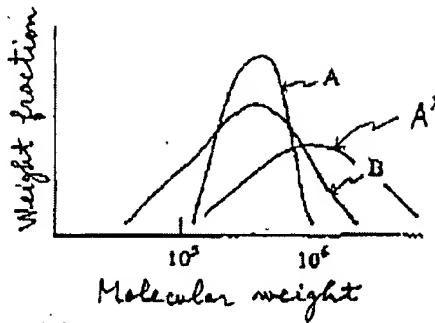
skill in the art would consider the "MW" provided in Tables II and III of the '772 patent as representing "molecular weight".

In regard to paragraph (4), with respect to the new reference, "Principles of Polymerization" Applicants agree with the Examiner's statement that "molecular weight of polymers is appropriately characterized as 'weight average molecular weight', 'number average molecular weight', or 'viscosity average molecular weight'". However, it should be noted that the molecular weight intended in the present invention means individual polymers that are used to calculate their average molecular weight. In more detail, on page 22 of the cited literature reference, "Principles of Polymerization", equations for calculating number average molecular weight (M_n) and weight average molecular weight (M_w) are shown. In those equations, the molecular weight intended in the present invention corresponds to "M_x".

In regard to paragraph (5) above, Applicants submit that the fact that the numerical value of 100,000 is not recited in the specific passages of the specification referring to low molecular weights components is not considered as a determinative factor for whether one of ordinary skill in the art would determine if the term "weight average molecular weight" or "molecular weight" was intended. Applicants submit that the teachings, content and the context of the specification as a whole is the proper source for determining the meaning and scope of the disclosure and the claims.

Applicants further note that the present invention has the characteristic that the polymer does not substantially contain low molecular weight components, and if contained, the amount is very small. Due to this characteristic, the polymer exhibits advantages to have excellent

properties such as cohesive or adhesive force and to not contaminate an adherend. Such a polymer is specifically shown below.



Polymer A and Polymer A' do not contain components having a molecular weight of 10^5 or less, which is acceptable in the present invention.

Polymer B contains components having a molecular weight of 10^5 or less, which is not acceptable in the present invention.

In view of the above, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 112, 2nd paragraph.

C. Prior Art Rejection under 35 U.S.C. § 103 over Bamba

With respect to the prior art rejection over Bamba, on page 6 of the Examiner's Answer, the Examiner states that the claim element of "10% by weight or less, based on the weight of the total monomers of components having a molecular weight of 100,000 or less", reads on the total absence of such components. The Examiner further states that in Bamba by ejecting the pressure-sensitive adhesive to a low-pressure region, the residual monomer and lower molecular weight components can be evaporated off or completely removed. The Examiner concludes therefore that "the disclosure of Bamba in col. 4, lines 65-67 through col. 5, lines 1-5

recites the embodiment wherein the low molecular weight component (Mw 100,000 or less) is completely removed.

Further, the Examiner admits that Bamba does not disclose an in line mixer or the recited residence time in a continuous reaction zone of the reactor. See page 7 of the Examiner's Answer lines 1-3. With respect to the element of an "in line mixer", the Examiner states that the breadth of "in line mixer," encompasses the extrusion apparatus taught by Bamba. See page 7, lines 7-8 of the Examiner's Answer. The Examiner also takes the position that the mixing of components in an extrusion apparatus is substantially similar to and encompasses mixing the monomer solution and CO₂ in the joint mixer as recited in the present claims (page 7, lines 8-10 of the Examiner's Answer). Further, the Examiner maintains that the structural elements of the apparatus are not given patentable weight.

Applicants respectfully traverse the rejection and submit that Bamba does not teach or suggest all elements of the presently claimed invention.

Independent claims 1 and 6 as amended are directed to a process for producing an acrylic pressure-sensitive adhesive comprising:

- (1) feeding a premixed monomer solution and carbon dioxide to a joint block equipped with a line mixer;
- (2) mixing the monomer solution and CO₂ in the joint mixer to produce a uniform mixture;
- (3) feeding the resultant uniform mixture to a continuous reactor; and
- (4) performing continuous bulk polymerization.

Bamba does not disclose or suggest a production process wherein a monomer mixture and an inert fluid are previously mixed uniformly by a line mixer, the resultant mixture is supplied to a continuous reactor and polymerization is performed therein as set forth in Appellants' Brief, which is incorporated herein by reference. See, e.g., Appellants' Brief on Appeal, page 22, lines 1-3. Further, Bamba does not teach or suggest producing a uniform mixture and feeding the resultant uniform mixture to a continuous reactor as recited in the amended claims.

In this regard Bamba describes two apparatuses for the disclosed method of producing a foamed pressure sensitive adhesive tape; a batch vessel and an extrusion apparatus. In the case of an extrusion apparatus it is disclosed, "for example, a pressure sensitive adhesive raw materials made of a raw material monomer, initiator, etc. and a pressurized inert fluid are continuously supplied to the extrusion apparatus to continuously polymerize the monomer in the extrusion apparatus." Column 4, lines 35-41. Further, it is disclosed that the use of an extrusion apparatus enables a production process to continuously carry out the steps of raw material supply polymerization foaming application. It is the Examiner's position the continuous process in an extrusion apparatus as described by Bamba is similar to mixing the monomer solution and carbon dioxide in the joint mixture as in the present claims.

However, the supply of the "raw materials" of Bamba does not meet the element of mixing the monomer "solution" and CO₂ in the joint mixer as in the present claims. Even further, the supply of raw materials and a pressurized inert fluid as disclosed in Bamba does not meet the element of mixing the monomer/initiator mixture and carbon dioxide "uniformly" in the joint block as recited in the claims as amended. Even if a monomer and carbon dioxide are

supplied to an extruder as disclosed in Bamba, they are introduced in a non-uniform state, and immediately heated. As a result polymerization proceeds locally and a polymer having a broad molecular weight distribution and containing a large amount of low molecular weight components is obtained. Further, in some cases gelation occurs and as a result, there is a possibility that the polymer clogs in the extruder.

As for the Examiner's contentions regarding the reaction time and temperature recited in the present claims we believe that the arguments of record, which are incorporated by reference herein, sufficiently distinguish the claimed invention over the prior art of record.

In view of the above, Bamba does not render the presently claimed invention obvious. Accordingly, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 103 over Bamba.

II. Conclusion

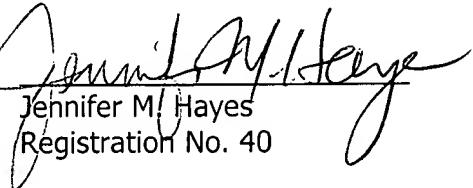
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. APPLN. NO. 09/918,532

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